

from 6 to 5 p. m., in order to insure the prompt transmission of the reports by cable. A heavy rainfall, 1.70 inches in thirty minutes, occurred on the 20th. The observer notes that on that date the morning barometric minimum was not well defined and that the afternoon minimum occurred two hours later than usual. Thunderstorms occurred on the 2d, 3d, 4th, 6th, 10th, 11th, 14th, 15th, 16th, 18th, 20th, 21st, 22d, 23d, 27th, 28th, and 30th.

Santo Domingo.—The observer makes reference to heavy deposits of dew. Rain was noted on 20 dates. The begin-

nings of rainfall were as follows: From 6 a. m. to noon, 7; noon to 6 p. m., 7; 6 p. m. to midnight, 9; midnight to 6 a. m., 3. Thunderstorms occurred on the 1st, 2d, 3d, 7th, and 24th.

Port of Spain, Trinidad.—The usual meteorological reports from this station for the months of August, September, and October were received a few days since but not in time to include the October statistics in Table I. Thunderstorms occurred on the 1st, 4th, 19th, 24th, 26th, 27th, and 28th.

Kingston, Jamaica.—No meteorological reports have been received from this station.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 61.3°, or about 2.0° below normal; the highest was 96°, at Pineapple on the 7th, and the lowest, 24°, at Hamilton on the 31st. The average precipitation was 4.22, or about 2.00 above normal; the greatest monthly amount, 13.43, occurred at Gadsden, and the least, 0.40, at Thomasville.—*F. P. Chaffee.*

Arizona.—The mean temperature was 65.0°, or 0.8° below normal; the highest was 105°, at Maricopa on the 1st and at Parker on the 13th, 14th, and 15th; the lowest was 18°, at Flagstaff on the 20th and 26th and at Snowflake on the 20th. No precipitation fell in the Territory, except traces at Flagstaff and Strawberry.—*W. G. Burns.*

Arkansas.—The mean temperature was 60.0°, or 1.2° below normal; the highest was 100°, at Conway on the 4th, and the lowest, 23°, at Pond on the 26th. The average precipitation was 5.44, or 3.11 above normal; the greatest monthly amount, 11.18, occurred at Moore, and the least, 2.82, at Powell.—*E. B. Richards.*

California.—The mean temperature was 61.0°, or 0.4° below normal; the highest was 111°, at Volcano Springs on the 5th, and the lowest, 9°, at Bodie. The average precipitation was 0.59, or 0.50 above normal; the greatest monthly amount, 5.39, occurred at Crescent City, while none fell at about fifty stations.—*W. H. Hammon.*

Colorado.—The mean temperature was 44.0°, or 3.2° below normal; the highest was 94°, at Crook on the 1st, and the lowest, 1° below zero, at Garnett on the 17th. The average precipitation was 0.83 or 0.15 below normal; the greatest monthly amount, 2.85, occurred at Pagoda, and the least, 0.05, at Delta.—*F. H. Brandenburg.*

Florida.—The mean temperature was 71.6°, or nearly normal; the highest was 96°, at Crawfordville on the 14th, and the lowest, 30°, at the same station on the 27th. The average precipitation was 6.12, or about 1.80 above normal; the greatest monthly amount, 16.99, occurred at Key West, and the least, 3.10, at Haywoods.—*A. J. Mitchell.*

Georgia.—The mean temperature was 62.6°, or 1.5° below normal; the highest was 95°, at Bainbridge on the 6th and at Jesup on the 4th, and the lowest, 26°, at Morgan on the 26th. The average precipitation was 6.07, or 3.61 above normal; the greatest monthly amount, 14.52, occurred at Clayton, and the least, 2.31, at Bainbridge.—*J. B. Marbury.*

Illinois.—The mean temperature was 52.1°, or about 1.0° below normal; the highest was 90°, at Decatur on the 3d, and the lowest, 14°, at Lanark on the 27th. The average precipitation was 3.96, or 1.96 above normal; the greatest monthly amount, 6.42, occurred at Cobden, and the least, 2.22 at Astoria.—*C. E. Linney.*

Indiana.—The mean temperature was 53.9°, or 0.6° above normal; the highest was 91°, at Fort Wayne on the 3d and at Winamac on the 4th, and the lowest, 21°, at Paola on the 27th. The average precipitation was 4.56, or 2.22 above normal; the greatest monthly amount, 7.90, occurred at Angola, and the least, 0.91, at Bedford.—*C. F. R. Wuppenhans.*

Iowa.—The mean temperature was 47.5°, or about 3.0° below normal; the highest was 88°, at Clarinda on the 2d, and the lowest, 17°, at Estherville, on the 31st. The average precipitation was 3.56, or 1.33 above normal; the greatest monthly amount, 5.75, occurred at Ridgeway, and the least, 1.27, at Larchwood.—*G. M. Chappel.*

Kentucky.—The mean temperature was 57.1°, or about 0.5° above normal; the highest was 93°, at Maysville on the 3d, and the lowest, 21°, at Loretto on the 26th. The average precipitation was 4.19, or 2.27 above normal; the greatest monthly amount, 6.65, occurred at Greensburg, and the least, 1.70, at Princeton.—*H. B. Hersey.*

Louisiana.—The mean temperature was 65.3°, or 1.6° below normal; the highest was 99°, at Plaquemine on the 6th, 9th, 10th, 11th, and the lowest, 24°, at White Sulphur Springs on the 27th. The average

precipitation was 4.59, or 1.98 above normal; the greatest monthly amount, 14.37, occurred at Port Eads, and the least, 1.69, at Whitehall.—*A. G. McAdie.*

Maryland and Delaware.—The mean temperature was 57.3°, or 2.8° above normal; the highest was 89°, at Chase, Md., on the 1st, and the lowest, 17°, at Sunnyside, Md., on the 28th. The average precipitation was 4.64, or 1.65 above normal; the greatest monthly amount, 8.28, occurred at Frostburg, Md., and the least, 2.87, at Solomons, Md.—*F. J. Wals.*

Michigan.—The mean temperature was 49.1°, or 1.7° above normal; the highest was 93°, at Clinton on the 3d, and the lowest, 13°, at Ewen on the 27th. The average precipitation was 4.38, or 2.10 above normal; the greatest monthly amount, 7.38, occurred at Mottville, and the least, 1.04, at Sidnaw.—*C. F. Schneider.*

Minnesota.—The mean temperature was 42.9°, or about 2.0° below normal; the highest was 85°, at Faribault on the 2d, and the lowest, 14°, at Pokegama on the 14th. The average precipitation was 3.83, or about 2.00 above normal; the greatest monthly amount, 6.22, occurred at Minneapolis, and the least, 1.14, at Crookston.—*T. S. Outram.*

Mississippi.—The mean temperature was 62.2°, or nearly 2.0° below normal; the highest was 100°, at Columbus on the 6th, and the lowest, 27°, at Austin, Lake, and Pontotoc on the 27th. The average precipitation was 3.58, or about 1.70 above normal; the greatest monthly amount, 6.94, occurred at Holly Springs, and the least, 0.60, at Thornton.—*W. T. Blythe.*

Missouri.—The mean temperature was 53.3°, or 2.5° below normal; the highest was 94°, at Mount Vernon on the 2d and at Lamar on the 3d, and the lowest, 19°, at Willow Springs on the 31st. The average precipitation was 4.16, or 2.17 above normal; the greatest monthly amount, 8.63, occurred at Sikeston, and the least, 2.41, at Louisiana.—*A. E. Hackett.*

Montana.—The mean temperature was 39.1°, or about 5.0° below normal; the highest was 75°, at Crow Agency on the 22d, and the lowest, 2° below zero, at Fort Logan on the 5th. The average precipitation was 1.47, or about 0.38 above normal; the greatest monthly amount, 2.82, occurred at Glendive, and the least, 0.06, at Darby.—*E. J. Glass.*

Nebraska.—The mean temperature was 46.9°, or 3.5° below normal; the highest was 97°, at Camp Clarke on the 1st, and the lowest, 6°, at Fort Robinson on the 26th. The average precipitation was 0.90, or about 0.50 below normal; the greatest monthly amount, 3.90, occurred at Brokenbow, while none fell at several stations in the northwestern portion of the State.—*G. A. Loveland.*

Nevada.—The mean temperature was 45.9°, or 3.1° below normal; the highest was 86°, at Mill City on the 15th, and the lowest, 7°, at Wells on the 1st. The average precipitation was 0.23, or 0.24 below normal; the greatest monthly amount, 1.41, occurred at Lewers Ranch, while none fell at several stations.—*R. F. Young.*

New England.—The mean temperature was 51.1°, or 2.6° above normal; the highest was 91°, at Cumberland Mills, Me., on the 4th, and the lowest was 18°, at Flagstaff, Me., on the 10th; at Woodstock, Vt., on the 18th, and at Jacksonville, Vt., on the 22d. The average precipitation was 6.53, or 2.78 above normal; the greatest monthly amount, 12.05, occurred at Kingston, R. I., and the least, 2.65, at Flagstaff, Me.—*J. W. Smith.*

New Jersey.—The mean temperature was 56.5°, or 3.2° above normal; the highest was 88°, at Trenton on the 3d, and the lowest, 24°, at Charlotteburg on the 23th. The average precipitation was 5.76, or 2.16 above normal; the greatest monthly amount, 8.42, occurred at Englewood, and the least, 3.92, at Cape May City.—*E. W. McGann.*

New Mexico.—The mean temperature was 53.5°, or 0.6° below normal; the highest was 94°, at Eddy on the 3d, and the lowest, 5°, at Buckmans on the 20th. The average precipitation was 0.14, or 0.88 below normal; the greatest monthly amount, 0.75, occurred at Whiteoaks, while none fell at twelve stations, and only traces at six.—*R. M. Hardinge.*

New York.—The mean temperature was 52.0°, or 2.8° above normal; the highest was 90°, at Auburn on the 1st, and the lowest, 18°, at Bolivar and Franklinville on the 18th. The average precipitation was 4.92, or 1.50 above normal; the greatest monthly amount, 8.94, occurred at Easton, and the least, 2.75 at Madison Barracks.—*R. G. Allen.*

North Carolina.—The mean temperature was 60.3°, or 0.8 above normal; the highest was 90° at Fayetteville on the 3d and at Rockingham on the 4th, and the lowest, 21°, at Highlands on the 27th. The average precipitation was 6.42, or 2.85 above normal; the greatest monthly amount, 18.49, occurred at Linnville, and the least, 2.26, at Lumberton.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 38.6°, or 3.8° below normal; the highest was 84°, at Ashley and Forman on the 1st, and the lowest, 8°, at Fort Yates on the 25th. The average precipitation was 2.37, or 1.41 above normal; the greatest monthly amount, 6.20, occurred at Milton, and the least, 0.30, at Glenullin.—*B. H. Bronson.*

Ohio.—The mean temperature was 54.1°, or about 2.0° above normal; the highest was 96°, at Milligan on the 4th, and the lowest, 20°, at Cambridge and Levering on the 28th. The average precipitation was 3.72, or 1.68 above normal; the greatest monthly amount, 7.87, occurred at Elyria, and the least, 1.76, at Hedges.—*J. Warren Smith.*

Oklahoma.—The mean temperature was 60.1°; the highest was 110°, at Waukomis on the 2d, and the lowest, 21°, at Fort Reno on the 22d, at Anadarko and Wagoner on the 26th, and at Norman on the 30th. The average precipitation was 1.97; the greatest monthly amount, 5.38, occurred at Wagoner, and the least, 0.48, at Anadarko.—*J. I. Widmeyer.*

Oregon.—The mean temperature was 49.5°, or 1.6° below normal; the highest was 84°, at Langlois on the 16th, and the lowest, 11°, at Burns on the 3d. The average precipitation was 2.01, or 1.06 below normal; the greatest monthly amount, 8.51, occurred at Bay City, and the least, trace, at Burns.—*B. S. Pague.*

Pennsylvania.—The mean temperature was 53.8°, or 3.7° above normal; the highest was 92°, at Derry Station on the 4th, and the lowest, 20°, at Hollidaysburg, Shinglehouse, Smethport, and Somerset on the 28th. The average precipitation was 5.20, or 1.96 above normal; the greatest monthly amount, 8.62, occurred at Wellsboro, and the least, 2.36, at Wilkesbarre.—*T. F. Townsend.*

South Dakota.—The mean temperature was 42.7°, or about 4.0° below normal; the highest was 88°, at Chamberlain, Hotch City, and Pierre on the 1st, and the lowest, 2° below zero, at Rochford on the 25th. The average precipitation was 1.28, or about normal; the greatest monthly amount, 4.20, occurred at Flandreau, while none fell at Forest City.—*S. W. Glenn.*

Tennessee.—The mean temperature was 57.6°, or about normal; the

highest was 93°, at Pope on the 5th and at Covington on the 6th, and the lowest, 20°, at Erasmus on the 28th. The average precipitation was 4.34, or about 2.00 above normal; the greatest monthly amount, 8.80, occurred at Oakhill, and the least, 0.98, at Covington.—*H. C. Bate.*

Texas.—The mean temperature, determined by comparison of 36 stations distributed throughout the State, was 1.0° below the normal. The temperature was about the normal over the panhandle, and there was a slight deficiency over the western portions of the State and a general deficiency, ranging from about 1.0 to 3.0 over the eastern portions, with the greatest deficit in the vicinity of Tyler. The highest was 104°, at Fort McIntosh on the 1st and at Lampasas on the 2d, and the lowest, 23°, at Mount Blanco on the 26th. The average precipitation, determined by comparison of 37 stations distributed throughout the State, was 0.89 below the normal. There was a slight excess in a few localities over the central portion of the State, while there was a general deficiency elsewhere, ranging from 1.00 to 3.39, with the greatest deficit along the east coast. The greatest monthly amount, 6.60, occurred at Huntsville, while none fell at several stations.—*I. M. Chline.*

Utah.—The mean temperature was 47.0°; the highest was 90° at St. George on the 12th, and the lowest, 3°, at Loa on the 22d. The average precipitation was 0.67; the greatest monthly amount, 2.40, occurred at Tooele, while none fell at several stations.—*J. H. Smith.*

Virginia.—The mean temperature was 58.4°, or about 1.0° above normal; the highest was 90°, at Farmville on the 4th, and the lowest, 21°, at Blacksburg on the 28th. The average precipitation was 6.21, or 3.04 above normal; the greatest monthly amount, 12.01, occurred at Stanardsville, and the least, 2.52, at Warsaw.—*E. A. Evans.*

Washington.—The mean temperature was 49.1°, or about 1.0° below normal; the highest was 79°, at Kennewick on the 14th, and the lowest, 11°, at Waterville on the 16th. The average precipitation was 2.79, or about normal; the greatest monthly amount, 11.01, occurred at Clearwater, and the least, trace, at Fort Simcoe and Waterville.—*G. N. Salisbury.*

Wisconsin.—The mean temperature was 45.2°, or 1.3° below normal; the highest was 82°, at Grantsburg on the 2d, and the lowest, 9°, at Hartford City on the 27th. The average precipitation was 4.01, or 1.82 above normal; the greatest monthly amount, 5.80, occurred at Whitehall, and the least, 1.34, at North Crandon.—*W. M. Wilson.*

Wyoming.—The mean temperature was 39.7°; the highest was 82°, at Fort Laramie on the 1st, and the lowest, 4°, at Labarge on the 20th. The average precipitation was 0.96; the greatest monthly amount, 2.25, occurred at Fort Yellowstone, and the least, 0.10, at Big-piney.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

A RECORD OF SOME KITE EXPERIMENTS.

By WILLIAM A. EDDY, Bayonne, N. J. (dated December 5, 1898).

My first experiment with a kite was in 1863, when with another boy I tied a lantern to the tail of an ordinary kite at night. The lantern was soon extinguished by the rapid motion of the kite tail, but it did not occur to me to suspend the lantern from the string below the kite. In 1887 I heard of the life-saving use of the kite for towing buoys ashore, invented by J. Woodbridge Davis, of New York, and while looking up the subject, I read an account of the experiments of E. Douglas Archibald, of England, published in *Nature*, in 1886. In a copy of the *Pall Mall Gazette* sent to me in 1896 or 1897 from London, Archibald is recorded as having taken a kite photograph in 1886. I am yet without knowledge of Archibald's method of suspending his camera, but one of his kite photographs which I saw at Blue Hill Observatory when I first flew my kite there on July 30, 1894, revealed the fact that his camera pointed straight downward. The view was dated 1888. In the London article mentioning Archibald's kite-photograph, M. Batut, of France, is credited with a kite-photograph in the same year. Wenz, of Paris, seems to have taken up the subject of kite-photography in 1890 or 1891. He has recently sent to me, care of Blue Hill Observatory, a clear kite-photograph, not titled, but evidently of the Seine in Paris, for which I shall send him two of my own of the Capitol at Washington, one taken by hand from the roof of the Coast Survey Building, and the other with the camera suspended from the kite cable about 300 feet above the roof.

The European kite photographers seem to have taken map views, leaving the writer to take his first perspective view from kites on May 30, 1895, at Bayonne, N. J.¹

In 1890 I began with tail kites of the ordinary pattern and

¹ To this catalogue of dates of kite work the Editor may add that in the spring of 1885, at the conclusion of a series of balloon ascensions for meteorological purposes made for the Army Signal Service by Prof. S. A. King, of Philadelphia, an additional ascent was made for special military purposes. Photographic apparatus was carried, and pictures taken from the balloon, although not very successfully. Mr. Eddy states that some striking photographs were taken at Winsted, Conn., about 1885, by an aeronaut whose name is unknown.

As Professor King has devoted his life to the practical utilization of the balloon in every imaginable way, it will be interesting to add the following extract from a recent letter from him:

"In my scrap book I find a print of my first photographic experiment. * * * It was during the month of August in 1860. The attempt was made at Providence, R. I., and Mr. J. W. Black, of Boston, was the photographer. In October following, Mr. Black and myself ascended from Boston and succeeded in obtaining two fine views of the central portion of the city, each view containing features of historic interest. An article in the *Boston Herald* referring to the experiment is dated October 16, 1860, and mentions it as taking place on the previous Saturday. On the 4th of July, 1893, Mr. W. N. Jennings accompanied me with photographic apparatus and succeeded in obtaining the three views of Philadelphia which have been widely distributed and are, undoubtedly, the best views ever taken from a balloon."

Copies of these magnificent photographs are at the Weather Bureau; they were evidently taken instantaneously with a very superior lens, and give perspective views, as distinguished from the vertical projections or map views. Photographic views from balloons for military purposes were taken during the war of 1861-65, but we do not know that any special benefits resulted.—*Ed.*